Why HERS and Codes Have Historically Been (and Still Are) Hard to Mix

Why HERS and Codes Don't Mix—Scope Mismatches

- Space heating b
- Space cooling b
- Water heating ?
- Lighting ?
- Appliances ?

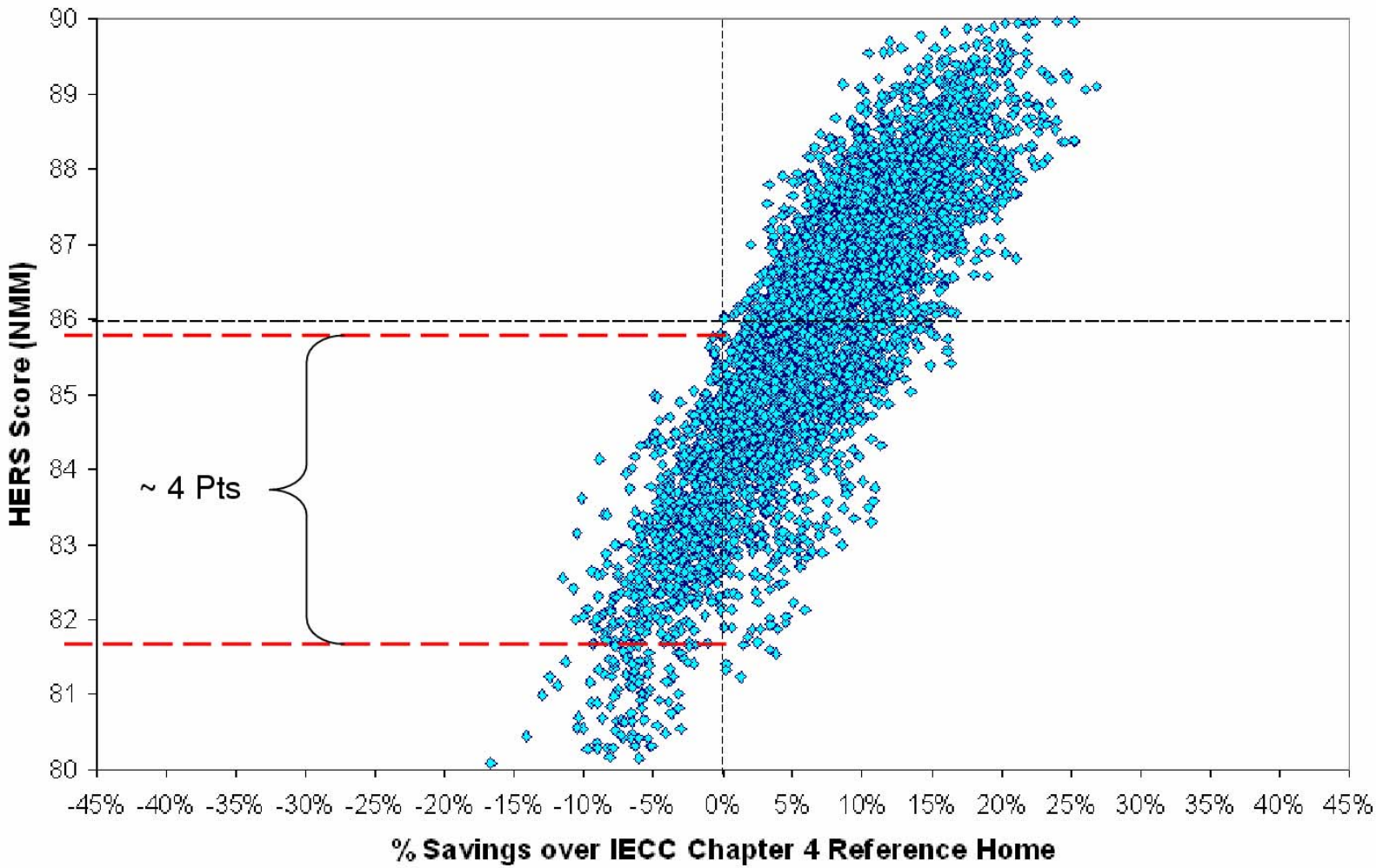
Why HERS and Codes Don't Mix—Mismatches between performance path and HERS rules

- Differences in reference house (baseline U-factors/SHGCs, distribution efficiencies, treatment of glazing area, assumed baseline system for electric heat, etc.)
- Different metrics of comparison (site energy vs energy cost vs normalized modified end use load)
- Differences in comparison methodology (e.g., AC modeled in home w/o AC?)

Therefore…There is a HUGE disparity between code compliance and HERS scores

HERS vs Code

For 6,912 Homes (Climate Zone 5)



Why HERS and Codes Don't Mix—"How much better" is irrelevant to the code

- Pass/fail only
- Performance calcs are a zero-sum game
- "Credit" for innovative features simply allows other features to be less efficient
- Upshot: Tools to show code compliance can be much less sophisticated without compromising correctness
- Simplicity still rules

Ultimate HERS/Codes Vision

A HERS Compliance Path in the IECC

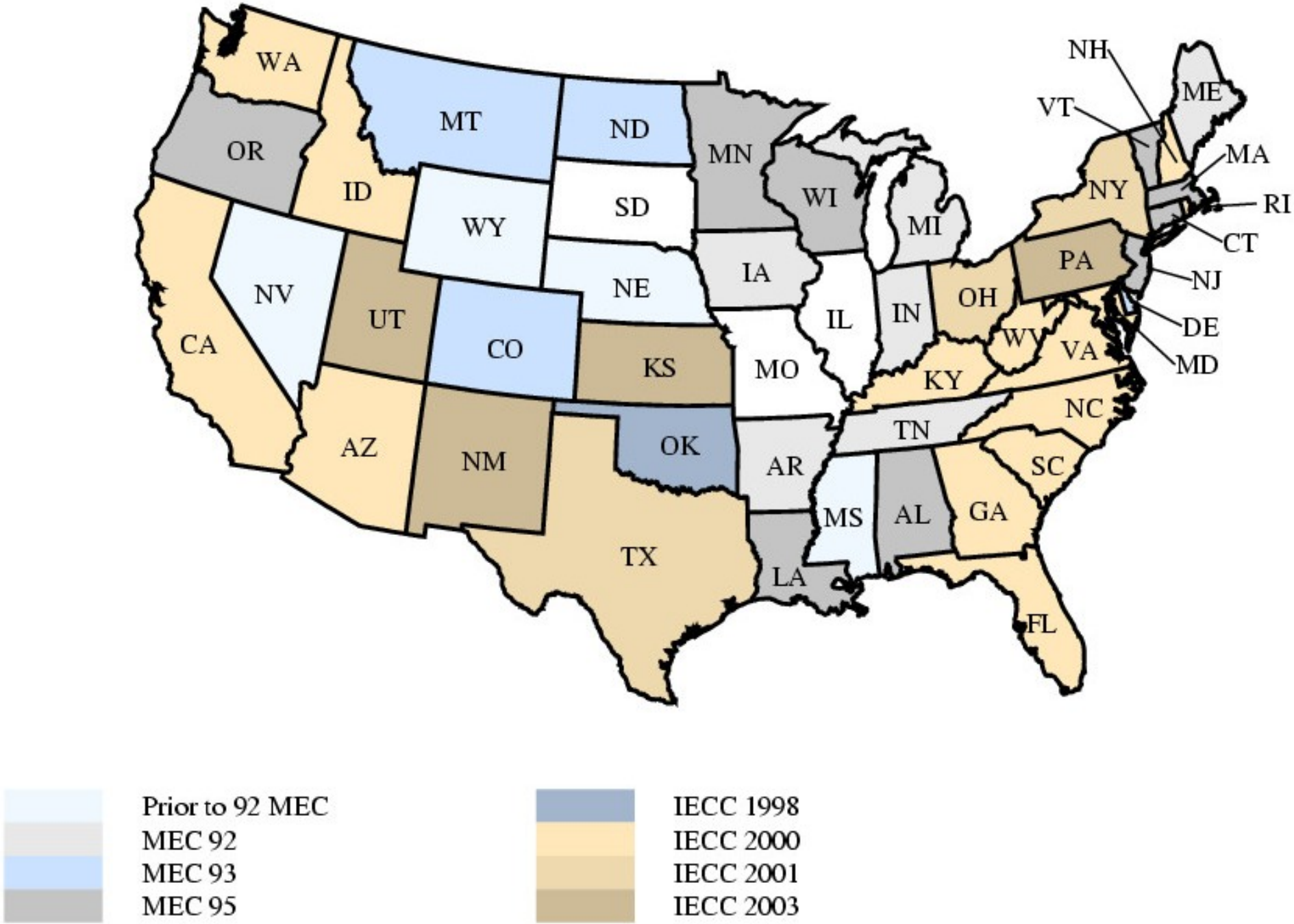
HERS Compliance Path—Why?

- Make “how much better” relevant—encourage builders to go beyond code
- Use DOE’s substantial codes infrastructure to promote beyond-code tools and programs (e.g., voluntary programs can lose their marketing pizazz)

HERS Compliance Path—Why?

- Help work better-than-minimal efficiency into the residential construction/sales industry culture (e.g., would you buy a home that hadn't had the plumbing pressure tested?)
- Help build up the necessary infrastructures so that the code can eventually require the really important things (actually-sealed envelopes and ducts, right ventilation, advantageous orientation, etc.)

HERS Compliance Path—Problem: Old Codes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DE
MD
Prior to 92 MEC
MEC 92
MEC 93
MEC 95
IECC 1998
IECC 2000
IECC 2001
IECC 2003

HERS Compliance Path—Problem: Old Codes

- Many are still in place
- Many will remain in place for many years to come
- Cannot be revised by IECC code changes
- Without impacting them, achieving HERS-in-code goal can take 10+ years

Idea: HERS Mapping

Mapping out the territory between
HERS scores and code compliance

HERS Mapping—Approach

- Identify which HERS scores comply with which codes, where, and under what conditions
- Basically, a massive simulation experiment covering
  - All major extant codes
  - All house types (size, shape, no. stories, foundation type, glazing percentage, etc.)
  - All fuel/equipment types
  - One (or two) HERS rulesets
  - All U.S. locations

HERS Mapping—Approach, cont'd.

- Would focus on prescriptive, not performance paths
  - Find equivalence with what really happens in the field
  - Avoid all the nasty nuances of old performance paths
  - And…
- Would NOT seek to comply ALL houses

HERS Mapping—Likely product

Jurisdiction: Philadelphia Area		
Code	*Required HERS Score*	
	To comply 75% of homes	*To comply 90% of homes*
MEC-95	81, no elec resistance	82, no elec resist, no slabs
MEC-98	82, no slabs	83
IECC-2000	83, glazing < 17%	84, glazing < 17%, no bsmts
IECC-2003	84	85

HERS Mapping—Vision

- States/jurisdictions would use the resource to design HERS paths into existing codes
- DOE would develop generic recommendations/tools to help states
- DOE would use results to inform future code change proposals
- DOE would eventually propose a full HERS path to the code
- Energy Star link?